PURDUE UNIVERSITY

DEPARTMENT OF
FOOD SCIENCE

FINAL REPORT

To: **Renee Carnahan, Value Added Grant Program**
Office of the Commissioner of Agriculture

Date: **April 4, 2002**

From: **Ellen Harkness**

Subject: **Fund Center Number 653 1160-3012/Proposal DD70**
VA 00-281-405

IMPROVING INDIANA PRODUCED WINE QUALITY AND MARKETABILITY BY ON-SITE LABORATORY ANALYSIS

Project Objective:
During the past five years, Indiana has been the trendsetter in the establishment of new wineries and development of funded enology and viticulture programs designed to help establish successful, high quality wine production facilities. The quality of the wine product is directly related to the expertise of the winemaker; however, in this industry untrained and inexperienced operators establish the majority of new operations. This need for training, especially in laboratory analyses, and the wide distribution of wineries in all regions of the state prompted members of the Winegrowers Guild and the Indiana Wine Grape Council/Purdue University to write this project - to establish a "mobile laboratory" which would provide a mechanism to train winemakers on-site.

a) Equipment for mobile analytical laboratory

a) Based on discussions with various members of the wine industry including David Lundstrum, President of the Indiana Winegrowers Guild, equipment was purchased to build a small mobile unit which can be easily dismantled and packed into a small van. The unit is equipped with electrical and water inlets to be easily connected on location. It is equipped with glassware and chemicals to enable the winemaker and trainer to analyze for:

i. Wine acidity
   1. pH
   2. total acidity titration
   3. volatile acidity

ii. Alcohol
iii. Residual sugar
iv. Free and total sulfur dioxide
v. Malolactic fermentation
vi. Sensory evaluation techniques
vii. Microscope for microbial spoilage & sediment evaluation
viii. Balance for preparing wine fining materials

Plastic cases were purchased to transport the fragile glassware and chemicals safely.

b) Develop a winery laboratory procedure and record manual

a) Analytical procedures and explanations as well as basic laboratory procedures and charts of commonly used conversions for weight, volume, temperature, and commonly used formulas for amelioration and fortification of wines have been compiled are ready for a preliminary printing. This version will be taken on several of the winery trips with the mobile analyses unit for critiquing before the final printing.

b) Keith Butz has created the line drawings and caricatures needed for the various methods.

c) At least fifty water resistant manuals will be produced at the first printing. Thirty Indiana wineries will each receive a free copy, the rest will be sold. If the demand is great enough, a second printing will be ordered. I am working with the Office of Technology Commercialization at Purdue to copyright the manual and to determine the best resource for printing and distribution.

c) Assemble a team of trainers

a) One full time employee and four undergraduate students have been trained in laboratory analytical methods for wine during the project. They have been very helpful in developing three workshops/training sessions at Purdue and at Oliver Winery. These workshops have trained 175 people in aspects of wine microbiology, wine fining, and quality control/HACCP theory.

d) Provide training for the Indiana wine industry

a) The first training session was held April 21, 2001 at the Purdue Food Science Department. It was a wine microbiology workshop that was scheduled in response to several requests for this very specific training. The materials developed for the workshop will be included in the laboratory manual. Fifteen winemakers registered for this session.

b) The second session taught quality control/HACCP theory in winery management. It took place during the Indiana Winegrowers Symposium in Indianapolis, January 28, 2002, with about 60 in attendance.

c) The third session, The Art of Wine Fining, was taught as a joint workshop with Dr. Bruce Bordelon, Viticulture Specialist, at Oliver Winery on April 1, 2002, with 100 winemakers from Indiana, Ohio, Kentucky, and Illinois attending. The handout for the Wine Fining presentation will be incorporated into the Lab Manual for this project.

d) Ridge Winery in Vevay, In, in October 2002, was the site of the first analysis road trip. He needed to review his analytical techniques and he had several wines he wished to have analyzed with instruments he does not have at the winery but is considering purchasing (Vacuum Aspiration method for sulfur dioxide analysis).

e) Visits to two other wineries are scheduled for early May, 2002. The mobile lab will travel to at least one winery per month throughout the year.

e) Follow up training/analysis and program evaluation

Success of this program may be measured in the future by several parameters:

a) An increasing percentage of the Indiana wineries purchase good laboratory equipment and feel confident in their analytical techniques.

b) The number of flawed wines, refermentation problems, and generally low quality product is significantly reduced.

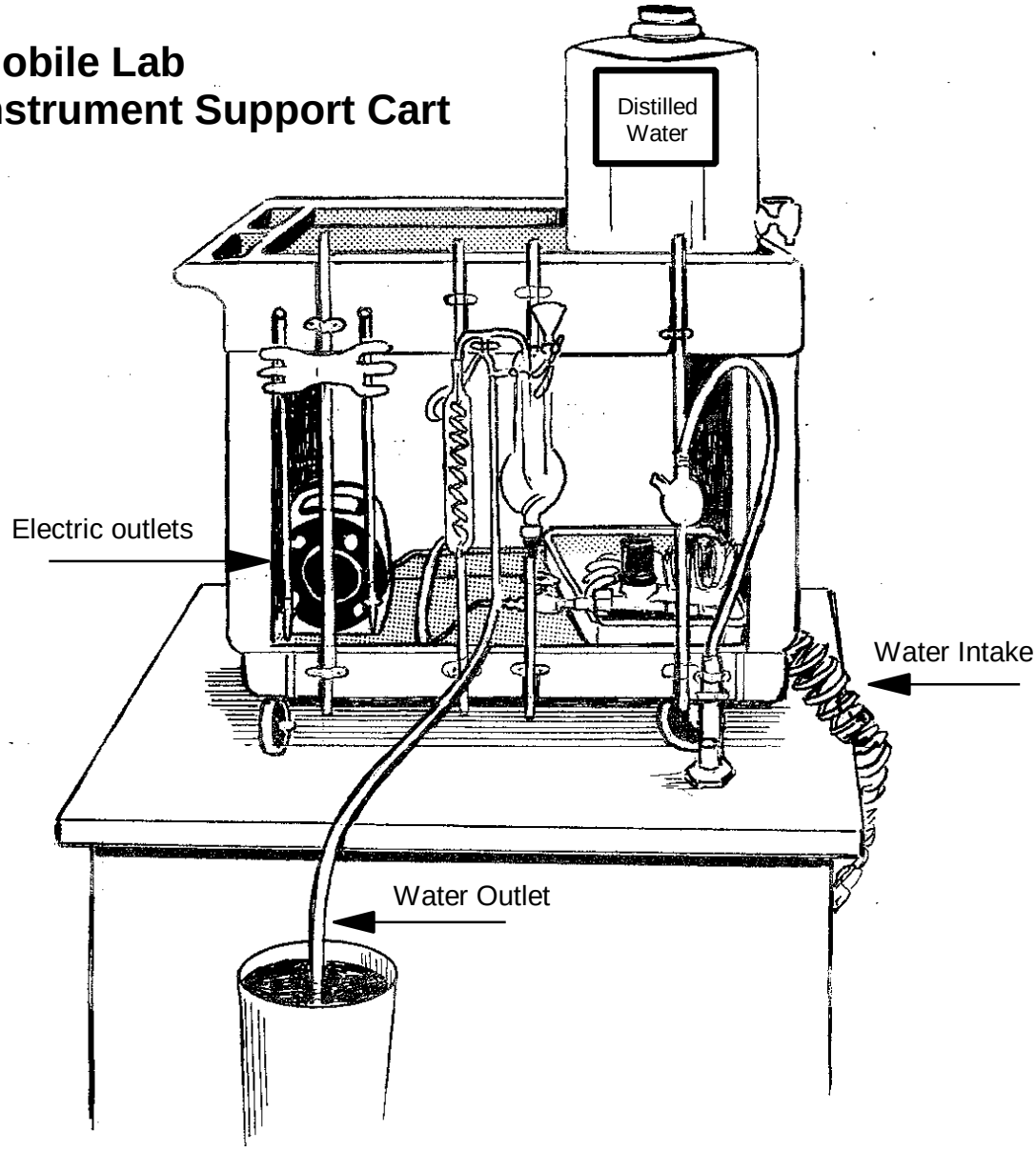
f) Revise procedures as needed

The manual is designed to be incorporated into a notebook. As new methodology, calculation tables, supplier information, etc., becomes available, follow up booklets will be printed and distributed to the Indiana wine industry to be added to their notebooks.

Summary

The funding for this project has enabled our team to assemble and disseminate information to the Indiana wine industry using a hands on environment that assures successful transfer of learning. The equipment and manual that were developed will continue to train winemakers for years to come. Speaking for the 27 Indiana wineries (8 new wineries since this proposal was accepted, an increase of 40%), I wish to express my sincere gratitude to the Office of the Commissioner of Agriculture for supporting our efforts to make the Indiana wine industry a model of premium wine production.

Mobile Lab
Instrument Support Cart



Ilustration by Keith Butz

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